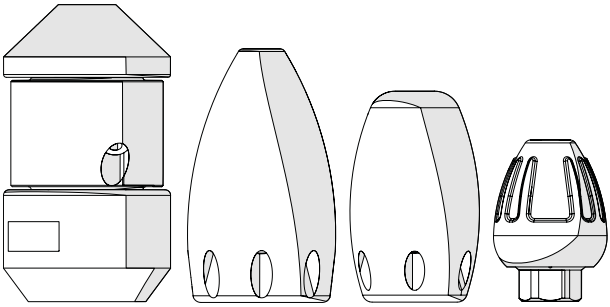
Duct/pipe cleaning nozzles

Operating instructions

Year of manufacture 1989 ... + Production quarter
KA
KA05-100, KA05-105, KA05-110, KA20-100, KA20-105, KA20-110, HRR-16, KRD-16, HRR-22, KRD-22, HRR-29, KRD-29, HRR-40, KRD-40, HRR-60, KRD-60
BA 0305029 R01 2021-11

Operating instructions for Duct/pipe cleaning nozzles.



MADE
IN
GERMANY

TEV▸JÄGER

Notes

It is **IMPORTANT** that you read these operating instructions **CAREFULLY BEFORE USE** and **RETAIN THEM FOR FUTURE REFERENCE**.

Visit our homepage at regular intervals and check for the latest version of the operating instructions.

The operating instructions are intended for...

Duct/pipe cleaning nozzles from year of construction 1989. The operating instructions have the revision level R00.

Components of a Duct/pipe cleaning nozzles and their function

Here you will find information about:
the components of the Duct/pipe cleaning nozzles.

Explanation of warning notices

Safety notices

These warning notices are for your safety. The warning notices can be found in the general chapter on safety and are always depicted when referring to an action that requires a separate warning notice.

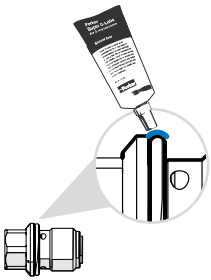
⚠ DANGER	Failure to comply will lead to serious injury or death.
⚠ WARNING	Failure to comply may lead to serious injury or death.
⚠ CAUTION	Failure to comply may lead to injuries.
NOTICE	Failure to comply may lead to material damage and impair the function of the product.
Attention –	Additional information about product operation.

Explanatory information

This information can be found in the grey shaded area in a diagram. This helps you to find the right diagram for the heading in the text, understand the details better, follow steps, understand movements and identify the position in the room.

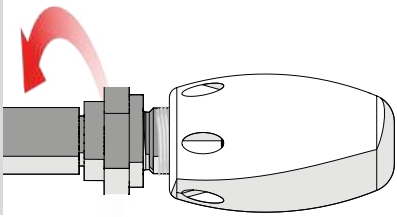
Clean the thread

The title of the image indicates the **text** to which the diagram belongs.



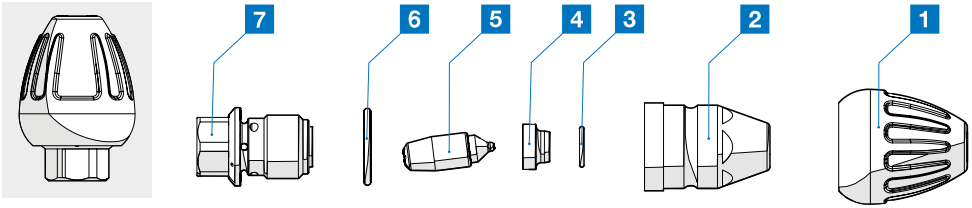
The detailed view highlights areas that are important.

The numbers on the diagrams are associated with the steps in the explanatory text. They always start anew at [1] on a double page.

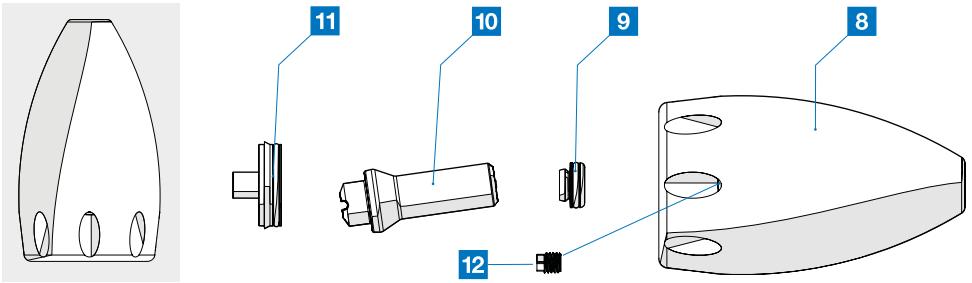


The red arrows always indicate a movement.

Overview of the rotor nozzle components



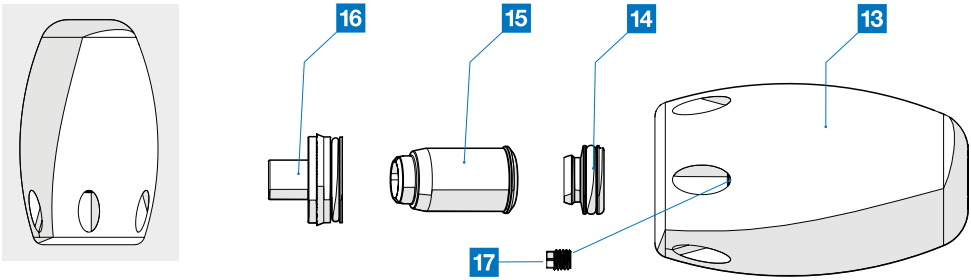
1 Protective cap (if installed)	5 Rotor
2 Pressure housing	6 O-Ring
3 O-Ring	7 Drive plug
4 Bearing unit	



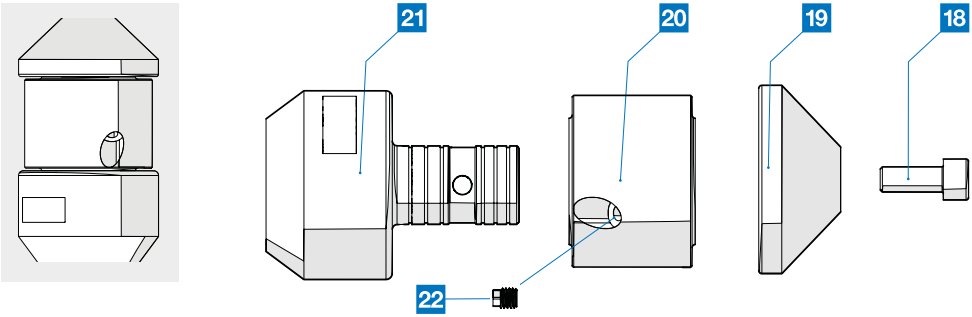
8 Pressure housing	11 Drive plug
9 Bearing unit	12 Recoil nozzle
10 Rotor	

Scope of delivery

The Duct/pipe cleaning nozzles are delivered fully assembled and are adapted to a specific pressure-flow ratio.



13 Pressure housing
14 Bearing unit
15 Rotor
16 Drive plug
17 Recoil nozzle



18 Cylinder screw M8 x 20 mm
19 Lid
20 Rotor
21 Stator
22 Recoil nozzle

Tools required for assembly and repair

1 Combination spanner suitable for the Duct/pipe cleaning nozzle or the high-pressure duct hose used.

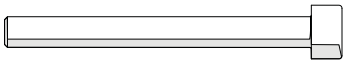
2 Pipe wrench for fastening the duct high-pressure hose, if there is no hexagon nut.

Tools required for repair

3 Mounting aid or, for example, ballpoint pen for removing the bearing unit.

4 Parker SUPER O-LUBE mounting grease and lubricant for greasing the O-rings.

5 Screw M4 x 60 mm for removing the drive nipple.



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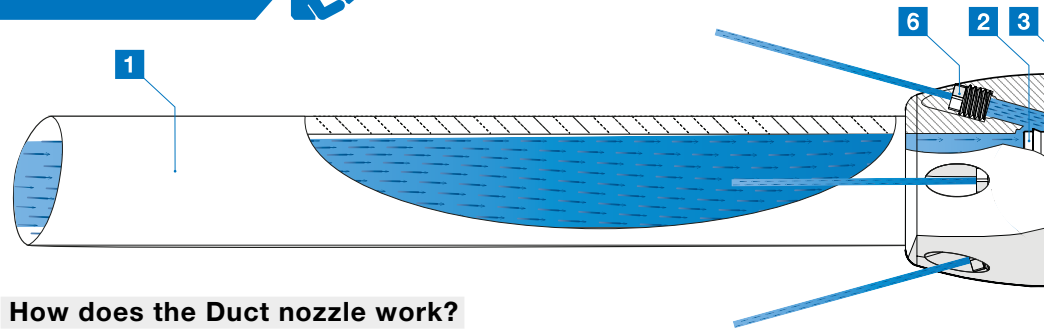


How does the Duct nozzle work?

This duct nozzle consists of a pressure housing, a drive plug or nipple, a rotor, a bearing unit and recoil nozzles. The duct nozzle generates a hard, cone-shaped spot jet of high-pressure water that rotates around an axial centre to loosen dirt and deposits. In addition, other hard spot jets provide propulsion.

How does this work exactly?

1. At the beginning, the high-pressure water 1 is fed into the drive plug or nipple via a feed line.

2. The high-pressure water comes out of the axially drilled holes 2 on the drive plug or nipple.

3. The high-pressure water fills the pressure housing 3.

4. As the high-pressure water fills the pressure housing at high speed, the rotor 4 is pushed into the bearing unit 5 and seals it against water leakage.

5. Now the high-pressure water can only flow through the rotor 4 and the recoil nozzle 6 to exit the housing.

6. This creates a pressurised water flow.

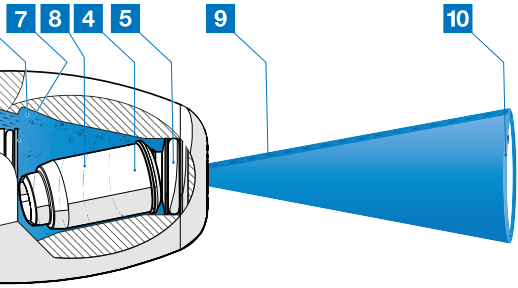
7. Because the water moves in an axial motion 7 through the holes of the drive plug, a rotating field is created by the flow of water 8.

8. The resulting rotating field sets the rotor in rotation. However, since the front part of the rotor is mounted in the bearing unit as a ball and socket, the rotor can only follow the rotating field with its rear part.

9. The centrifugal force acting on the rotor in the rotating field presses it against the pressure housing. In this way, the rotor completes a guided circular path.

10. This circular path is transferred to the spot jet 9 which is generated by the water outlet via the rotor. This is how the rotating 10 spot jet is created, which is then used to clean very effectively.

11. Synchronous to the cleaning action of the rotating spot jet, the recoil nozzles 6 use the spot jet to propel the duct nozzle forwards through the pipe.



Components and their function

1 **Protective cap** protects the pressure housing from direct impacts.

2 **The pressure housing** contains all the nozzle components. It is the pressure body that, together with the drive plug, must withstand the specified maximum pressure.

3 **The drive plug/drive nipple** closes the pressure body and, together with the pressure housing, must withstand the pressure. In addition, the drive plug with its axial bores, generates the rotating field, which sets the rotor in rotation.

4 **The rotor** creates a water backpressure with a built-in round nozzle. Together with the high-pressure cleaner, the desired water pressure is then achieved. In addition to generating pressure, the rotor is also responsible for the circular path of the spot jet.

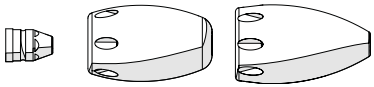
5 **The bearing unit** is the axial pivot point. Using a ball-and-socket principle, the bearing unit, together with the nozzle of the rotor, forms the fixed pivot point for the rotation.

6 **The O-rings** seal the pressure area on the drive plug and on the bearing unit.

7 **The recoil nozzle** creates together with the round nozzle of the rotor, the maximum pressure and, with the help of the recoil effect, pushes the Duct/pipe cleaning nozzle forward.

1

2



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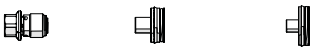
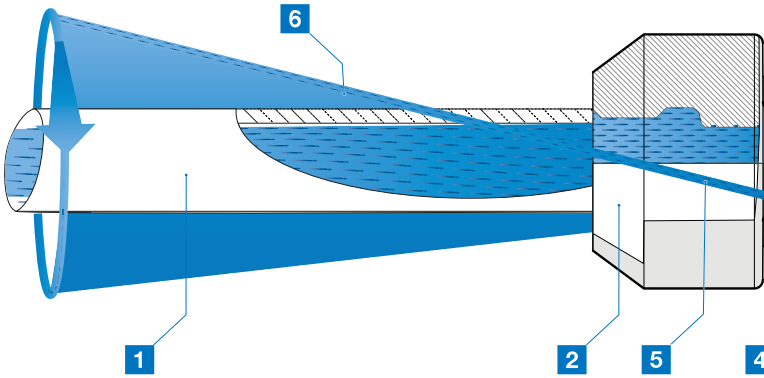


4

5

6 **7**



How does the rotary nozzle work?

This duct nozzle consists of a stator, a rotor and a lid that holds everything together.

The duct nozzle generates a hard spot jet of high-pressure water, which sets a rotor in rotation to loosen dirt and deposits. In addition, this hard spot jet ensures propulsion.

How does this work exactly?

1. At the beginning, the high-pressure water 1 is fed into the rotary nozzle via a feed line.

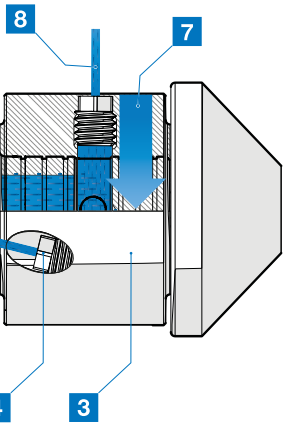
2. The high-pressure water flows over the stator 2 in the rotor 3 up to the round nozzles 4.

3. A dynamic pressure builds up due to a defined bore diameter of the round nozzles.

4. The water charged with this dynamic pressure 5 passes the round nozzles.

5. The backwards slanting/outwards pointing 6 and horizontally/upward pointing round nozzles push the rotary nozzle into the pipe and set the rotor into rotation 7. In addition, dirt is removed evenly and rinsed out to the rear.

6. The vertically 8 aligned round nozzles enhance the cleaning effect by the jet striking the inside of the pipe vertically.



Components and their function

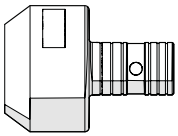
1 **The stator** forms the base. It is here that the connection mechanism and water distribution are located. In addition, it forms the axis around which the rotor can rotate.

2 **The rotor** is the base for the spot jet nozzles. These are always aligned in the rotor in such a way that they set the rotor in rotation by means of the recoil impulse. Some versions have additional spot jet nozzles, which channel water jets vertically outwards.

3 **The lid + the cylinder head screw** keep the rotor on the stator axis.

4 **The recoil nozzle,** together with the rotary nozzle of the rotor, generates the maximum pressure and propels the duct nozzle forwards by means of the recoil effect.

1



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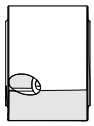

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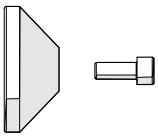
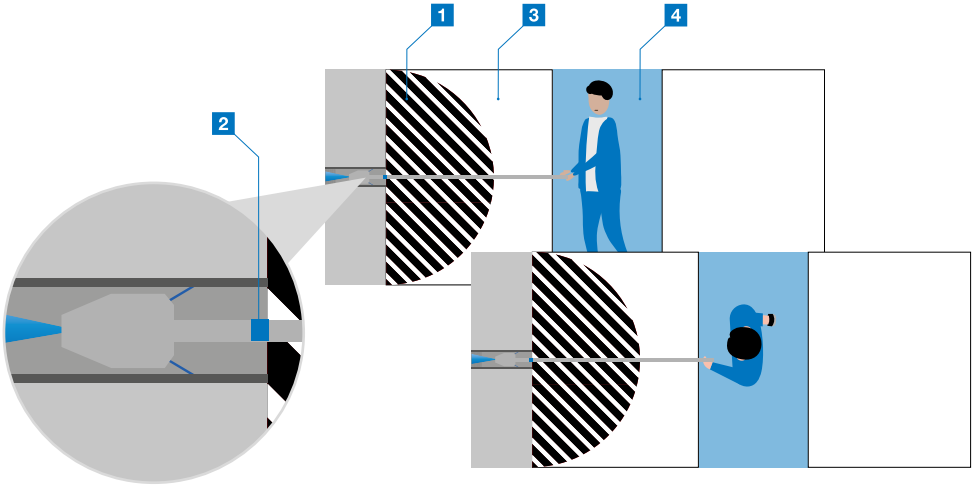


4

Intended use

Here you will find the following information:
For what purposes may the Duct/pipe cleaning nozzle be used? Where can the Duct/pipe cleaning nozzle be used? Who may use the Duct/pipe cleaning nozzle?



Intended use

The Duct/pipe cleaning nozzle is intended for cleaning pipes with non-organic surfaces with high-pressure water.

Requirements for the surface to be cleaned

The surface to be cleaned may not be organic. The surface must be suitable for being cleaned with a hard water jet.

User requirements

Operator: The operator has been instructed by the plant operator about the tasks assigned to him and possible dangers in case of improper behaviour. The operator may only carry out tasks that go beyond normal operation if this is specified in these instructions and the plant operator has expressly entrusted him with it.
Qualified personnel: Due to their professional training, knowledge and experience, as well as knowledge of the relevant standards and regulations, specialised personnel are able to carry out the work assigned to them and independently identify possible hazards and avoid hazards.

The following groups of people are not allowed to operate the rotor nozzle:

- People with limited physical, sensory or mental capacities
- Children and young persons under 18 years of age
- People who have not undergone specific instruction

Space requirements

- Restricted area 1: a 2 metre distance from the operator, to be measured from the safety marking 2 of the high pressure duct hose. The safety mark when starting the Duct/pipe cleaning nozzles must be within the pipe.
- Security zone 3: 5 Metres
- Space for movement 4: 2 metres

Maximum performance data

The performance data depends on the type and can be found in the technical data of the individual versions. The performance data given here are general data on our Duct/pipe cleaning nozzles.

- Operating pressure: between 150 and 300 bar
- Speed of spot jet: 3,500 to 5,000 revolutions per minute
- Noise level during normal operation: 95 decibels
- Vibration value: 9 m/s^2
- The volume flow depends on the type and can be found in the technical data of the individual versions.
- The maximum water temperature depends on the type. Please consult the technical data of the individual types.

Technical changes

- The Duct/pipe cleaning nozzle must not be modified.

Water quality for operation

- The rotor nozzle requires tap water.
- It is important to ensure that the water does not contain any impurities.

Requirements for the high-pressure cleaner

- The high-pressure cleaner must correspond to the performance data of the rotor nozzle. Please refer to the specific technical data for your version.

EC Declaration of Conformity

Der Hersteller / Inverkehrbringer TEV Jäger mbH, Grundweg 10, 89250 Senden
erklärt hiermit, dass folgendes Produkt

Produktbezeichnung:	Kanaldüse mit Rotationspunktstrahl
Modellbezeichnung:	Druckbereich Kennzahl 05, 20,
Typbezeichnung:	KA
Seriennummer:	Produktionszeitraum in Quartal
Handelsbezeichnung:	z.B. KA05-110
Baujahr:	1989

Beschreibung:
Düse für die Reinigung in Rohren mit rotierendem Punktstrahl, der entweder zentral mittig aus der Düsenspitze austritt oder um die Gehäuse Mitte rotiert. Die Düse hat zusätzlich für den vorwärtstrieb Düsen die aus der Düsenrückseite schräg nach Außen strahlen.

Allen einschlägigen Bestimmungen der angewandten Rechtsvorschriften (nachfolgend) - einschließlich deren zum Zeitpunkt der Erklärung geltenden Änderungen - entspricht. Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller. Diese Erklärung bezieht sich nur auf die Maschine in dem Zustand, in dem sie in Verkehr gebracht wurde; vom Endnutzer nachträglich angebrachte Teile und/oder nachträglich vorgenommene Eingriffe bleiben unberücksichtigt.

Folgende Rechtsvorschriften wurden angewandt:
Maschinenrichtlinie 2006/42/EG, Lärmschutz-Richtlinie 2000/14/EG
Folgende harmonisierte Normen wurden angewandt:

EN 60335-2-79:2012	Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke - Teil 2-79: Besondere Anforderungen für Hochdruckreiniger und Dampfreiniger (IEC 60335-2-79:2012 (modifiziert))
EN ISO 12100:2010	Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung (ISO 12100:2010)
EN ISO 13732-1:2008	Ergonomie der thermischen Umgebung - Bewertungsverfahren für menschliche Reaktionen bei Kontakt mit Oberflächen - Teil 1: Heiße Oberflächen (ISO 13732-1:2006)
EN ISO 20643:2008	Mechanische Schwingungen - Handgehaltene und handgeführte Maschinen - Grundsätzliches Vorgehen bei der Ermittlung der Schwingungsemission (ISO 20643:2005)
EN ISO 3744:2010	Akustik - Bestimmung der Schallleistungs- und Schallenergiepegel von Geräuschquellen aus Schalldruckmessungen - Hüllflächenverfahren der Genauigkeitsklasse 2 für ein im Wesentlichen freies Schallfeld über einer reflektierenden Ebene (ISO 3744:2010)
EN ISO 4413:2010	Fluidtechnik - Allgemeine Regeln und sicherheitstechnische Anforderungen an Hydraulikanlagen und deren Bauteile (ISO 4413:2010)

Name und Anschrift der Person, die bevollmächtigt ist, die technischen Unterlagen zusammenzustellen:
Patrick Geiger, Grundweg 10, 89250 Senden

Ort: Senden Datum: 20.10.2021

(Unterschrift)
Anton Jäger

(Unterschrift)
Patrick Geiger

General safety instructions

Important instructions for safe use of the system and for ensuring safe cleaning.

For your safety

Here you will find information about choosing a safe cleaning location, sources of danger in the work area and sources of danger when working.

⚠ DANGER

Danger to life in severe weather conditions

- Never work during a storm.

This prevents the risk of being struck by lightning.

⚠ WARNING

Risk of injury due to excessive operating pressure

- Do not operate the pipe drain nozzle above the specified maximum operating pressure.

This protects you from injuries caused by uncontrolled flying connecting parts.

⚠ WARNING

Risk of injury from high-pressure jet and ejected parts

- Wear a protective suit suitable for high pressure.

This protects you from injuries caused by the high-pressure jet and ejected parts.

⚠ WARNING

Risk of injury due to a lack of marking

- Only use a high-pressure hose with safety marking for pipe cleaning.

This protects you from injuries caused by the high-pressure jet and ejected parts.

⚠ WARNING

Risk of injury due to sudden start-up

- Only run start and stop functions via a suitable system, never via the high-pressure cleaner.

This prevents injury caused by an unwanted start-up.

⚠ CAUTION

Illness and hypothermia caused by bad weather

- In bad weather, wear suitable protective clothing.

This will protect you from illness caused by hypothermia.

⚠ CAUTION

Damage to hearing on account of too much noise

- Wear hearing protection while working.

This will protect your hearing from damage caused by excessive noise.

⚠ CAUTION

Risk of injury from overloading/strain

- Take regular breaks.

This will prevent injuries caused by physical and mental overload and fatigue.

⚠ CAUTION

Risk of injury from ejected parts

- Wear full face protection.

This protects you from injuries caused by ejected parts.

⚠ CAUTION

Risk of injury due to prolonged use of vibrating machinery

- Take regular breaks.

This prevents injury occurring due to physical or mental exhaustion.

⚠ CAUTION

Risk of injury to uninvolved persons

- Check whether unauthorised persons are in the work area.

This will prevent personal injury due to collisions.

⚠ CAUTION

Risk of injury due to slippery surface

- Check the surface for any situations that may facilitate slipping.

This will protect you from falling and injuring yourself.

⚠ CAUTION

Risk of injury due to bypassing safety devices

- Never disable safety devices.

This protects you from injuries caused by uncontrolled moven
of the pipe drain nozzle during starting.

⚠ CAUTION

Risk of injury due to uncontrolled starting

- Only start the pipe drain nozzle when you have the high-pressure sewer cleaning hose securely in your hand.

This prevents personal injury and damage to property due to uncontrolled starting.

NOTICE

Risk of damage due to frost

- Prevent the pipe drain nozzle from freezing as this may cause damage to the components.

This is how to protect the pipe drain nozzle from frost damage.

Safe cleaning operation

Here you will find information about: choosing a safe cleaning location, sources of danger in the working area, sources of danger when working.

Safe operation

Safe operation of the Duct/pipe cleaning nozzle is described here.

Select a safe position

▸ The place of use and its conditions always determine the cleaning operation.

▸ Before setting up the equipment, carry out an inspection and consider how and where you can work safely.

Awareness of hazards in the working area

▸ Slippery floor (stability)
▸ Too little space to move freely
▸ Flammable gas or dust mixtures
▸ Defective power connections
▸ ...

Safety when cleaning

▸ When cleaning, make sure that you do not damage any surfaces, components or lines.

Check and prepare the high-pressure equipment

Before starting work, check
▸ the high-pressure connections for any signs of damage,
▸ the high-pressure duct hose for signs of damage and check that the safety marking is present,
▸ check the high-pressure gun for signs of damage.

⚠ CAUTION

Risk of injury due to slippery surface

▸ Check the surface for any situations that may facilitate slipping.

This will protect you from falling and injuring yourself.

⚠ CAUTION

Risk of injury due to falling

▸ Check your working area for unevenness and obstacles.

This will protect you from injuries resulting from a fall.

⚠ CAUTION

Risk of injury due to defective hoses and connections

▸ Check all high-pressure hoses and connections for damage.

In this way you will protect yourself from injuries caused by a hard water jet that splashes out.

⚠ CAUTION

Risk of injury to uninvolved persons

▸ Check whether unauthorised persons are in the work area.

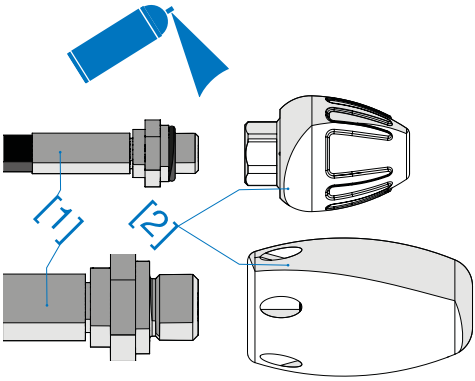
This will prevent personal injury due to collisions.

Commissioning of the Duct/pipe cleaning nozzle

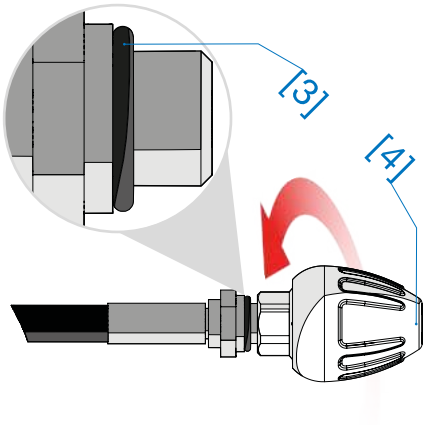
Here you will find information on preparing the Duct/pipe cleaning nozzle for operation.

Preparation and connection of the Duct/pipe cleaning nozzle

Clean the thread



Is there an O-ring?



Unpacking and checking

- Unpack the Duct/pipe cleaning nozzle.
- Check the Duct/pipe cleaning nozzle for external damage.
- Check that all components are present.
- Check the functional efficiency of the high-pressure gun.
- Check the connection threads on the Duct/pipe cleaning nozzles and on the pipe cleaning hose.

Install the Duct/pipe cleaning nozzle on the high-pressure hose

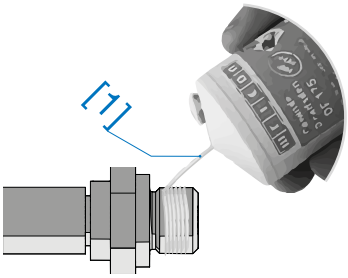
- Clean the thread of the high pressure duct hose [1] and the thread of the Duct/pipe cleaning nozzle [2] with a fat-dissolving cleaner.

CAUTION: Be careful not to flush any dirt into the Duct/pipe cleaning nozzle.

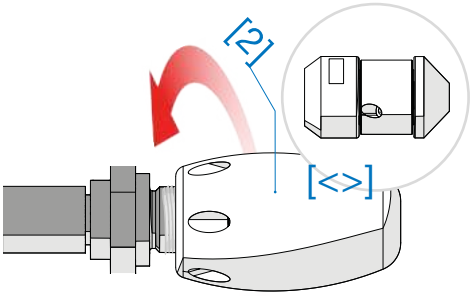
- Check if your pipe cleaning hose has an O-ring [3] on the thread for the nozzle connection.

- If there is an O-ring for sealing: Screw the Duct/pipe cleaning nozzle [4] up to the end of the threaded connection of the pipe cleaning hose.

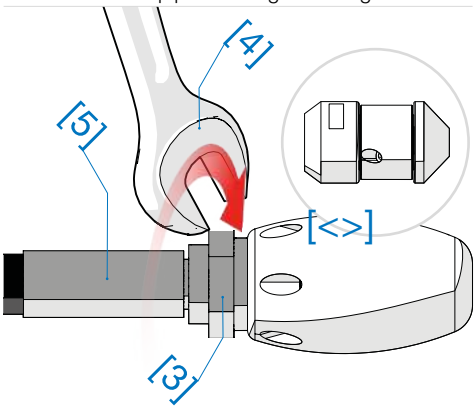
Seal using sealing thread



Unscrew the Duct/pipe cleaning nozzle



Screw the Duct/pipe cleaning nozzle tight



▸ If there is no O-ring for sealing: Use sealing thread [1] made of polyamide or fluoroplastic, which you apply to the threads of the threaded connection.

▸ Screw the Duct/pipe cleaning nozzle here also [2] right up to the end of the threaded connection.

▸ Suitably secure the Duct/pipe cleaning nozzle against twisting.

▸ When a hexagon nut [3] is present on the high-pressure hose: Apply the combination spanner [4] to the hexagon nut on the pipe cleaning hose [5].

▸ Screw the high-pressure hose tight with 15 Nm.

▸ If there is no hexagon nut on the pipe cleaning hose: Use a pipe wrench to screw it tight.

▸ Screw the pipe cleaning hose tight with about 15 Nm.

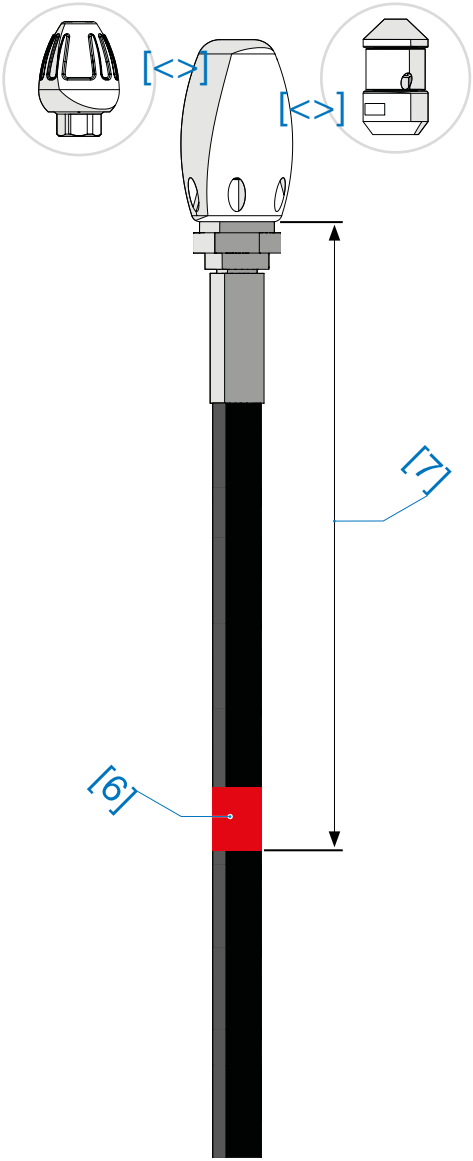
Please note: The same tightening torques apply when using adapters or quick couplings. In addition, the screw connections must be glued with LOCTITE 270.

⚠ CAUTION

Risk of injury during installation

▸ Wear gloves during installation.
This will protect your skin from abrasions and pinching.

Graphic for determining the position for



Working with the Duct/pipe cleaning nozzle

Find the right position for the safety marking

▸ In order to be able to work safely, attach a safety mark to your pipe cleaning hose [6] .

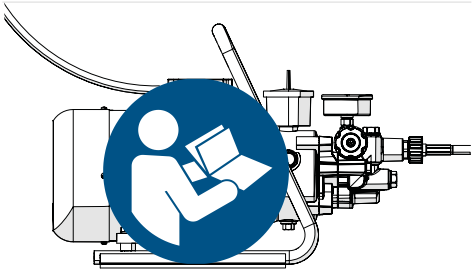
Position of the safety marking:
▸ Measure the inner diameter of the pipe you want to clean.

▸ Take the measurement and multiply it by 3 (example: 60 mm pipe diameter x 3 = 180 mm).

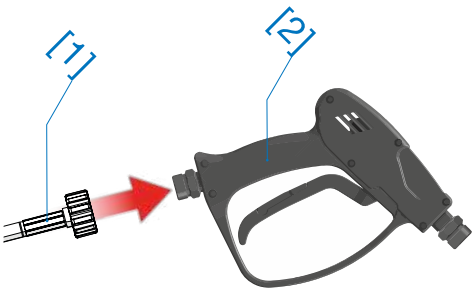
▸ Measure this distance [7] from the transition of the Duct/pipe cleaning nozzle to the pipe cleaning hose in the direction of the pipe cleaning hose.

▸ Make a mark at this point [6], e.g. with water-resistant adhesive tape.

Connect the high-pressure cleaner



Connect the high-pressure separation unit



Installation of a separation unit

▸ Connect the low-pressure water, the power supply and a high-pressure hose to the high-pressure cleaner according to the operating instructions of the high-pressure cleaner.

▸ Connect a suitable high-pressure separation unit [2] to this high-pressure hose [1].

PLEASE NOTE: This can be a high-pressure gun or a high-pressure ball valve. We will explain this using the example of the high-pressure gun.

INFO: With this high-pressure separation unit, it is possible to release the high water pressure in a dosed manner

⚠ CAUTION

Risk of injury due to defective hoses and connections

▸ Check all high-pressure hoses and connections for damage.

In this way you will protect yourself from injuries caused by a hard water jet that splashes out.

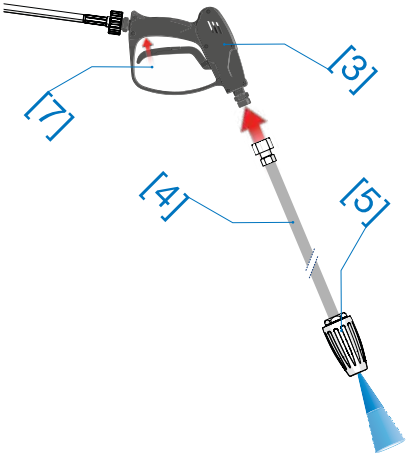
⚠ CAUTION

Risk of injury due to incorrect installation of the joints

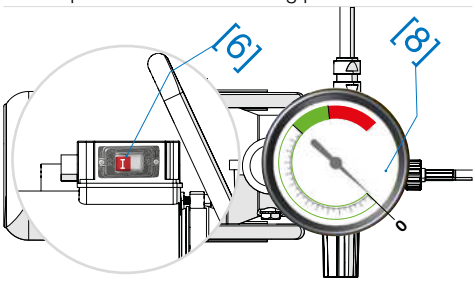
▸ Always hand-tighten and check the joints.

This will protect you from injuries caused by uncontrolled flying joints.

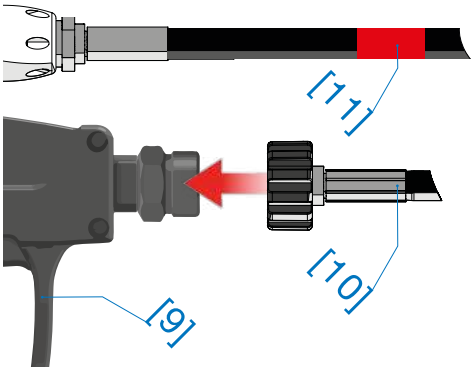
Connect the high-pressure lance



Start operation and set working pressure



Pipe cleaning hose



Set the working pressure

- Mount on the high-pressure gun: [3] a high-pressure lance [4] with a nozzle suitable for the pressure area of your pressure cleaner [5] (Flat jet or rotor).
- Start the pressure cleaner [6].
- Open the high-pressure gun [7].
- Adjust the pressure [8] on your high-pressure cleaner.
- Close the highpressure gun [7].
- Disassemble the high-pressure lance with the nozzle again.

Connect the Duct/pipe cleaning nozzle to the high water pressure

- Connect to the high-pressure separation unit: [9] the pipe cleaning hose [10] with the safety marking [11] and your Duct/pipe cleaning nozzle.

⚠ WARNING

Risk of injury due to excessive operating pressure

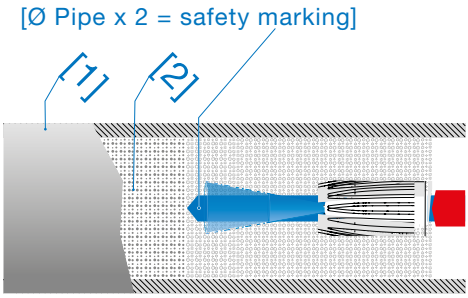
- Do not operate the machine above the specified maximum operating pressure.

In this way you protect yourself from injuries caused by connecting parts being flung away in an uncontrolled manner.

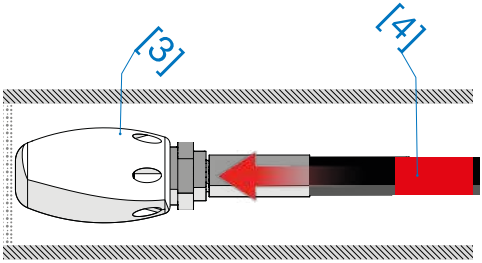
Working with the Duct/pipe cleaning nozzles

Here you will find information about working with the Duct/pipe cleaning nozzle.

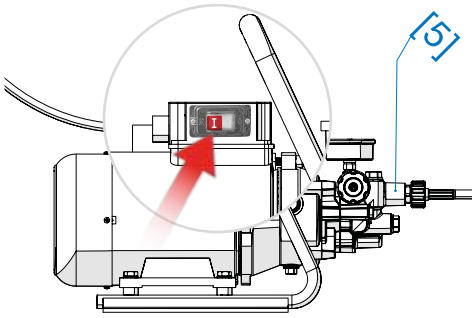
Clear the pipe



Insert the Duct/pipe cleaning nozzle



Start the high-pressure cleaner



Working with the Duct/pipe cleaning nozzle

Clearing the entrance area of the pipe

▸ Clear the pipe [1] of dirt [2] .

INFO: For this purpose, for example, a rotor nozzle or flat jet nozzle can also be used.
CAUTION: Also wear full face protection and protective suit here.

▸ Make sure that the Duct/pipe cleaning nozzle fits into the pipe up to the safety mark [4] on the pipe cleaning hose.

Insert the Duct/pipe cleaning nozzle into the pipe

▸ Guide the Duct/pipe cleaning nozzle [3] into the pipe up to the safety mark [4] .

Cleaning with the Duct/pipe cleaning nozzle

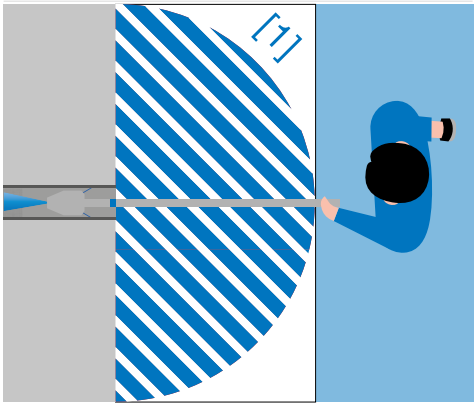
▸ Start your pressure cleaner [5].

⚠ CAUTION

Risk of injury from ejected parts

▸ Wear full face protection.
This protects you from injuries caused by ejected parts.

Take up a secure position at start-up

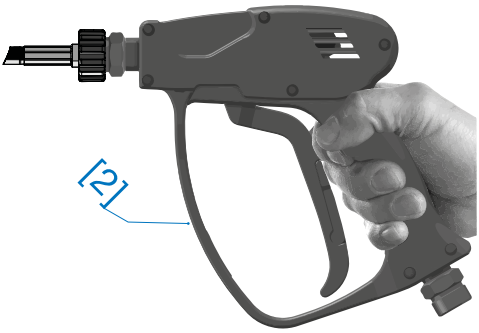


▸ Take up a safe position when starting the Duct/pipe cleaning nozzle [1] (about 2 metres distance to the pipe opening).

▸ Take the separation unit [2] in your hand.

▸ Take the pipe cleaning hose [3] in your hand and pull the high-pressure hose straight [4] without pulling the Duct/pipe cleaning nozzle out of the pipe.

Take the separation unit in your hand



⚠ CAUTION

Risk of injury to uninvolved persons

▸ Check whether unauthorised persons are in the work area.

This will prevent personal injury due to collisions.

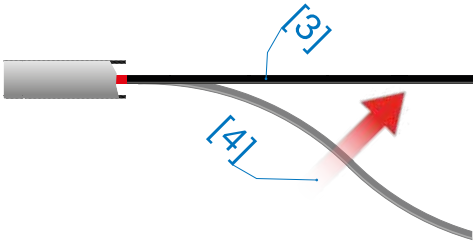
⚠ CAUTION

Risk of injury due to slippery surface

▸ Check the surface for any situations that may facilitate slipping.

This will protect you from falling and injuring yourself.

Pull pipe cleaning hose straight



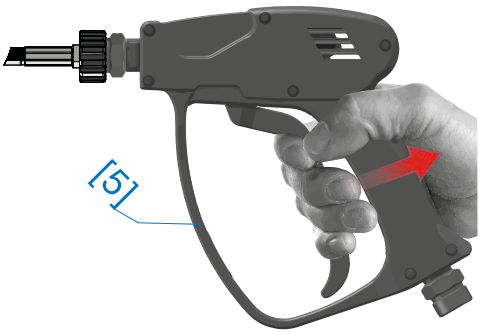
⚠ CAUTION

Risk of injury due to incorrect installation of the joints

▸ Always hand-tighten and check the joints.

This will protect you from injuries caused by uncontrolled flying joints.

Open the separation unit carefully

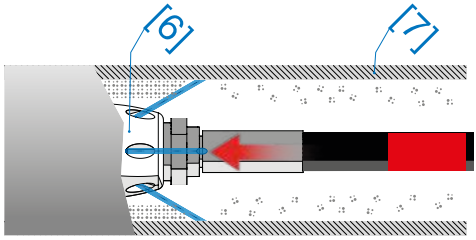


▸ Carefully fully open your separation unit [5] . The Duct/pipe cleaning nozzle [6] will begin to work its way into the pipe [7] work.

TIP: If the Duct/pipe cleaning nozzle sticks slightly, the forward movement can be improved again by briefly pulling it back.

▸ When the Duct/pipe cleaning nozzle has cleaned the pipe, pull [8] the Duct/pipe cleaning nozzle back towards the end of the pipe.

The Duct/pipe cleaning nozzle works its way into the pipe



⚠ CAUTION

Risk of injury from ejected parts

▸ Wear full face protection.
This protects you from injuries caused by ejected parts.

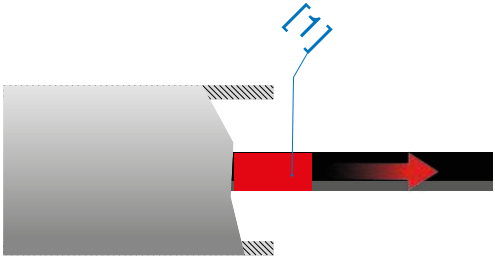
Retract the Duct/pipe cleaning nozzle

⚠ WARNING

Risk of injury from high-pressure jet and ejected parts

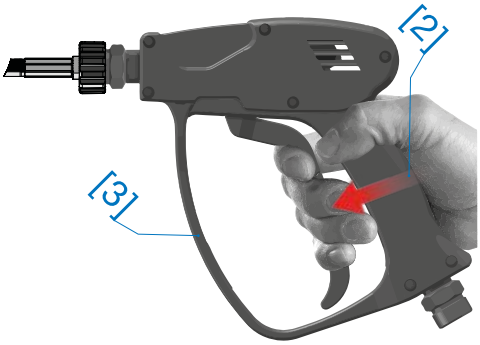
▸ Wear a protective suit suitable for high pressure.
This protects you from injuries caused by the high-pressure jet and ejected parts.

Pull out to the safety mark

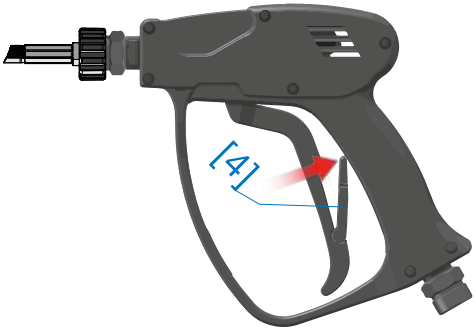


- Pull the pipe cleaning hose out until the safety mark [1] becomes visible at the pipe entrance.
- Close [2] the separation unit [3].
- Lock [4] the trigger of the separation unit.

Close the separation unit



Lock the trigger



Repairing the Duct/pipe cleaning nozzle

Here you will find information about repairing the Duct/pipe cleaning nozzle.

Defective pipe cleaning nozzle

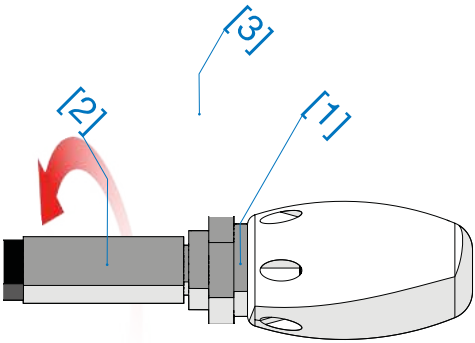
Possible error patterns

- No uniform cone spot jet
  » Nozzle or bearing is defective
- Uneven speed
  » Nozzle or bearing worn out
- Duct nozzle vibrates heavily
  » Rotor defect
- There is no jet of water coming from some of the recoil nozzles
  » Round nozzles clogged
- No rotation of the spot jet
  » Nozzle or bearing worn out

Troubleshooting measure

- If the nozzle or bearing is defective or worn, a new rotor and bearing unit must be installed.
- If a recoil nozzle does not work, it must be cleaned or replaced.

Unscrew the duct nozzle



Install the repair kit in the pipe cleaning nozzle

Open the pressure housing

- Suitably secure the pipe cleaning nozzle against twisting.
- If there is a hexagon nut [1] on the pipe cleaning hose [2] : apply the spanner [3] to the hexagon nut [1] .

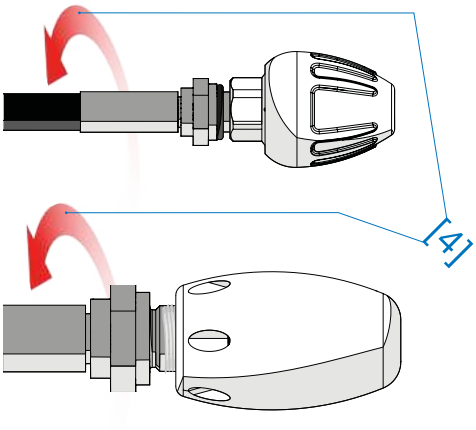
⚠ CAUTION

Risk of injury due to unintentional starting

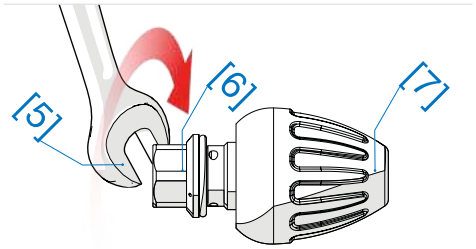
- Always disconnect the pipe drain nozzle from the high-pressure cleaner during maintenance work.

This prevents personal injury and damage to property due to uncontrolled starting.

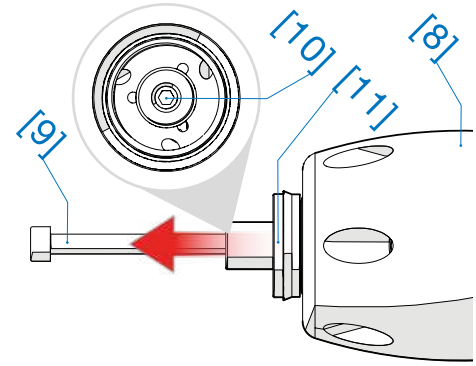
Unscrew the pipe cleaning nozzle



Unscrew the drive plug



Remove the drive nipple



- Unscrew [4] the pipe cleaning hose.

- If there is no hexagon nut on the pipe cleaning hose: use a pipe wrench to unscrew.

Remove the drive plug on the pipe cleaning nozzle

- Suitably secure the pipe cleaning nozzle to the pressure housing [7] so that it cannot twist or turn.

- Apply the spanner [5] to the hexagon nut of the drive plug [6] .

- Unscrew the drive plug [6] .

Remove the drive plug on the pipe cleaning nozzle

- Suitably secure the pipe cleaning nozzle [8] to the pressure housing to prevent twisting.

- Take the M4 x 60 mm screw [9] and screw it into the thread [10] of the drive plug [11].

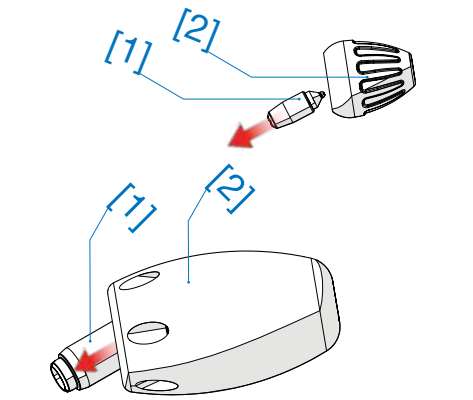
- Carefully pull the drive plug [11] by the screw [9] from the pressure housing.

⚠ CAUTION

Risk of injury during disassembly

- Wear gloves during disassembly. This will protect your skin from abrasions and pinching.

Remove the rotor



Remove the bearing unit

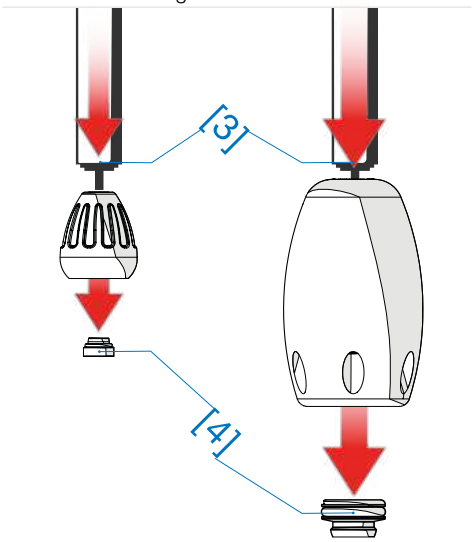
▸ Take the old rotor [1] from the pressure housing [2].

▸ Take the mounting aid [3] and press the bearing unit [4] out of the inside of the pressure housing.

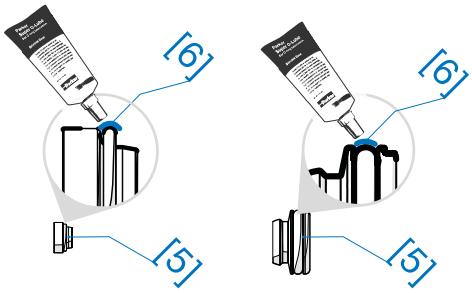
TIP: Instead of the mounting aid, you can also use a rounded object that has the diameter of the hole in the pressure housing.

▸ Clean any dirt from the pressure housing.

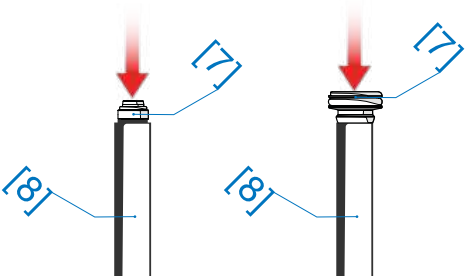
Remove the bearing unit



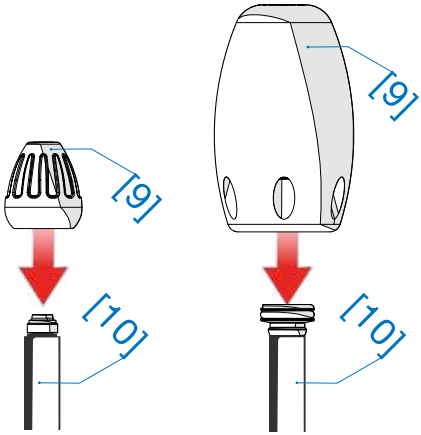
Grease the O-ring



Place the bearing unit on a mounting aid



Insert bearing unit



Insert a new bearing unit

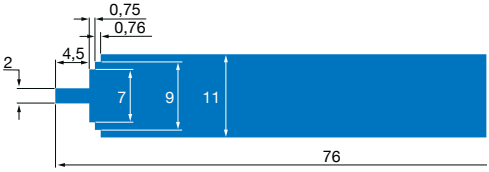
- Take the new bearing unit [5] and apply grease [6] to the O-ring.

- Place the bearing unit, [7] bearing seat first [8] on the mounting aid.

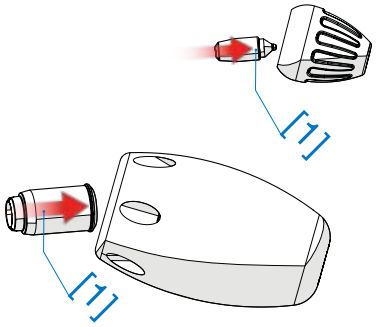
TIP: Instead of the mounting aid, you can also use, for example, a ballpoint pen.

- Insert the pressure housing [9] over the mounting aid [10] in your hand and press the bearing unit down to the bottom of the pressure housing.

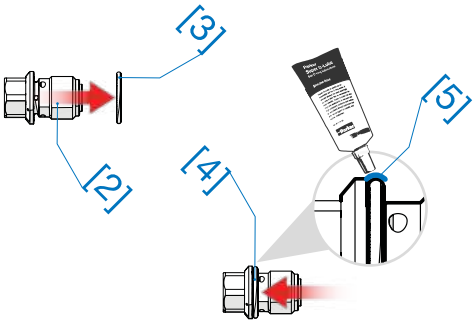
Graphic showing mounting aid (information in mm)



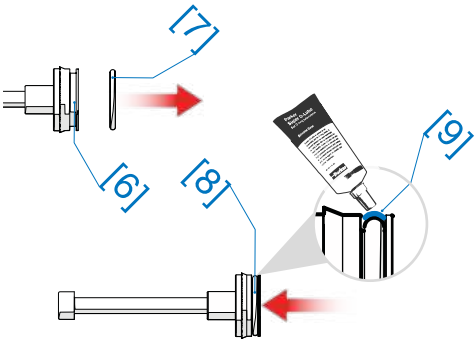
Insert rotor



Replace and grease the O-ring on the drive plug



Mount and grease the O-ring



Insert a new rotor

- Take the new rotor [1] and insert it nozzle first into the pressure housing.
- Push the rotor until it rests properly in the bearing unit.

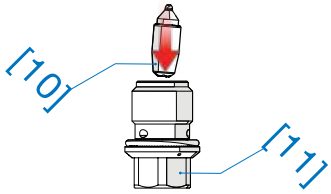
Change the O-ring on the drive plug

- Take the drive plug [2].
- Remove the old O-ring [3].
- Clean the drive plug.
- Install the new O-ring [4].
- Grease [5] the O-ring and thread.

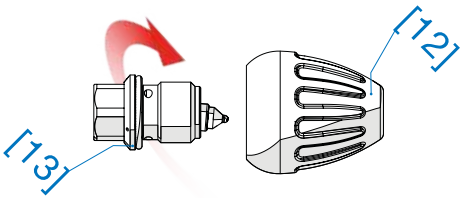
Change the O-ring on the drive nipple

- Take the drive plug [6].
- Remove the old O-ring [7].
- Clean the drive plug.
- Install the new O-ring [8].
- Grease [9] the O-ring and thread.

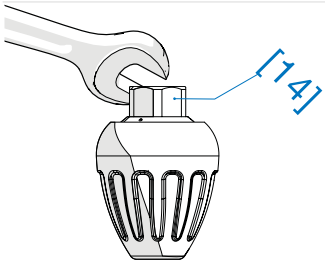
Insert the drive plug



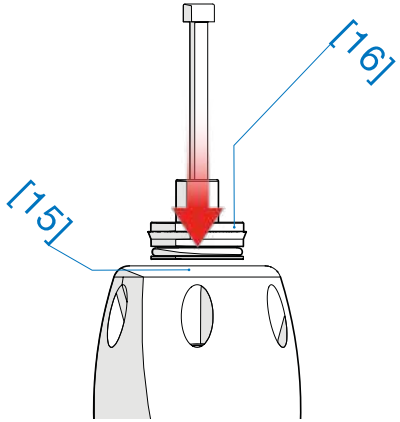
Screw in the drive plug



Screw the drive plug tight



Insert drive nipple



Assemble the pipe cleaning nozzle

- Stick the rotor, [10] nozzle tip upwards, into the drive plug [11].

- Hold the pressure housing [12] horizontally with the opening pointing to the side.

- Screw the drive plug [13] all the way into the pressure housing. ATTENTION: It is imperative not to trap the rotor.

- Suitably secure the pressure housing against twisting.

- Screw the drive plug tight [14] with 25 Nm.

Assemble the pipe cleaning nozzle

- Hold the pressure housing [15] vertically, with the opening facing upwards.

- Push the drive nipple [16] as far as it will go into the pressure housing. ATTENTION: It is imperative not to trap the rotor.

Change the recoil round nozzle

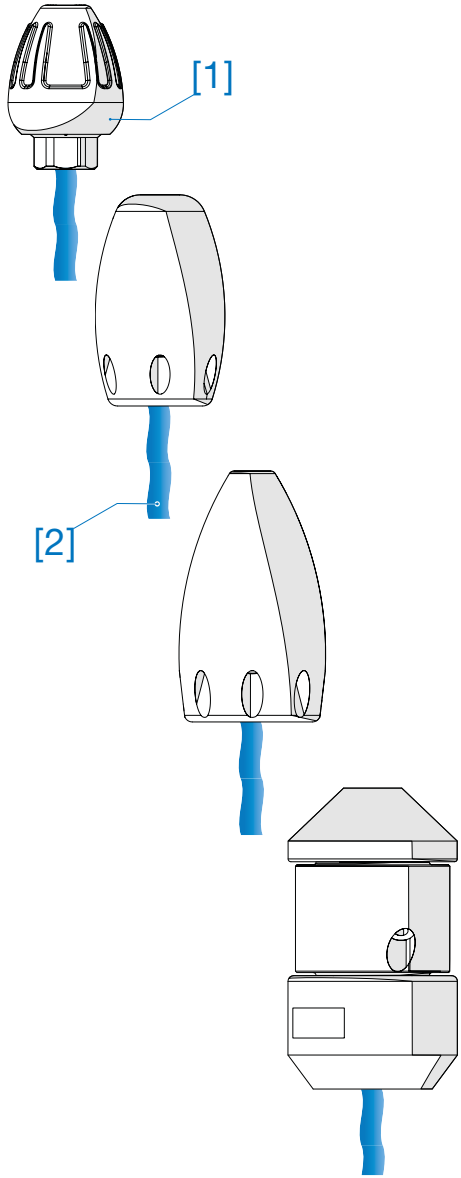
Since the round nozzles, which are responsible for the recoil, are glued to all Duct/pipe cleaning nozzles, they cannot be replaced separately.

In case of a defect, please contact your dealer.

Storing the Duct/pipe cleaning nozzle

Here you will find information storing the Duct/pipe cleaning nozzle.

Empty the Duct/pipe cleaning nozzle



Storing the Duct/ pipe cleaning nozzle

Drain the Duct/pipe cleaning nozzle

- Disconnect the Duct/pipe cleaning nozzle [1] from the pipe cleaning hose.

- Hold the Duct/pipe cleaning nozzle vertically and let the water [2] drain out of the Duct/pipe cleaning nozzle.

- Dry the Duct/pipe cleaning nozzle with a cloth.

NOTICE

Risk of damage due to frost

- Prevent the pipe drain nozzle from freezing as this may cause damage to the components.

This is how to protect the pipe drain nozzle from frost damage.

Disposal of the Duct/pipe cleaning nozzles

Here you will find information on how to dispose of the product and the associated components.

What happens to the waste?

Packaging

▸ The packaging is made of cardboard and can be recycled.

Protective cap, rotor, bearing unit

▸ These components can be disposed of with non-recyclable waste.

Pressure housing, drive plug

▸ These components can be given to metal recycling.

Waste water

▸ The water that is contaminated by the cleaning process must be disposed of in accordance with the regulations in the event of it containing any environmentally harmful contamination.

⚠ CAUTION

Risk of injury during disassembly

▸ Wear gloves during disassembly. This will protect your skin from abrasions and pinching.

TEV Jäger mbH | Grundweg 10 | 89250 Senden | +49 (0)7307 - 97606 0 |
info@tev-jaeger.de | www.tev-jaeger.com